

OPERATING AND SERVICE MANUAL

MODEL

700A

PART NO.

1001061-502

SERIAL NO.

4 6 6 4

FORM 144 REV 0378



AMPLIFIER RESEARCH

SOUDERTON, PA. 18964

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MODEL 700A

CAUTION NOTE:

IMPROVED PERFORMANCE CAN BE OBTAINED IF THE AMPLIFIER OUTPUT IMPEDANCE TAP IS SELECTED TO MINIMIZE REFLECTED POWER AS INDICATED ON THE PANEL METER. NORMALLY THIS WILL MATCH THE OUTPUT IMPEDANCE AND THE AMPLIFIER WILL RUN COOLER AND PROVIDE MORE OUTPUT VOLTAGE FOR THE SAME AMOUNT OF DRIVE.

DO NOT SWITCH THE IMPEDANCE TAP WITH POWER APPLIED TO THE LOAD. REMOVE DRIVE TO THE AMPLIFIER BEFORE SWITCHING.

ENGINEERING DEPARTMENT
AMPLIFIER RESEARCH

SECTION I

GENERAL INFORMATION

1.1 General Description

The Model 700A Power Amplifier is a self-contained high power unit designed primarily for severe industrial applications.

The Model 700A Amplifier is completely solid state. It is protected against damage which might be caused by excessive VSWR, high instantaneous line voltage, excessive output power or over-temperature operation. A built-in time delay and zero-crossing turn-on reduce current inrush to prolong component life. Power supply regulation is used to remove noise and output fluctuations. A directional wattmeter and front panel selector switch provide convenient measurement of forward power from the amplifier and reverse power reflected by the load. Cooling is provided by self-contained fans. All sub-assemblies are plug-in for easy maintenance and repair.

1.2 POWER SUPPLIES.

This unit has a self-contained 115 VAC, 50/60 Hz regulated power supply. The power consumption is a nominal 1500 watts @ 700 watts output. Primary fusing is provided. Delayed zero-crossing turn on circuitry is used to avoid high in-rush currents.

1.3 SPECIFICATIONS

Refer to Amplifier Research Data Sheet on next page for detailed specifications.



ULTRASONIC POWER AMPLIFIER
700 WATTS, 10-250 KHz
MODEL 700A

The Model 700A Power Amplifier is completely solid state and contains no mechanical circuit breakers or relays. Even its over-temperature sensor is a solid state device. Designed for severe industrial applications, the Model 700A Amplifier is protected from damage which might be caused by excessive VSWR, high instantaneous line current, excessive output power or over-temperature operation. A built-in time delay and zero-crossing turn-on reduce current inrush to prolong component life. Power Supply voltage regulation is used to remove noise and output fluctuations. A directional wattmeter and front panel selector switch provide convenient measurement of the forward power from the amplifier and reverse power reflected by the load. A non-linear meter scale allows extremely sensitive tuning of the load simply by adjusting for minimum reflected power.

The Model 700A cooling is provided by self-contained fans. Air is drawn in through filtered inlets to protect the circuitry from exposure to excessively dirty environments which may be encountered in industrial applications. All sub-assemblies are plug-in and can be readily removed for maintenance and repair.

The Model 700A may be purchased initially for low power requirements and when additional power is required another Model 700A and a hybrid power combiner may be used to provide performance equivalent to our Model 1400A.

The Model 700A is complete with a built-in 115 VAC power supply, regulators, power meter and protection circuitry. It is normally supplied in a handsome bench top cabinet with rack mounting available as an option.

160 SCHOOL HOUSE ROAD
Souderton, PA. 18964

PHONE: 215-723-8181

REV 0379

SECTION II

OPERATING INSTRUCTIONS

2.1 GENERAL

Operation of the Model 700A Power Amplifier is simple and straight forward. The input signal is fed to the jack marked INPUT and the amplifier output is taken from the jack marked OUTPUT. Both input and output jacks are standard type BNC. The unit is turned on by activating the power switch marked OFF, ON. In the event of a malfunction protection is provided by internal shutdown circuits, and also by fusing located at the rear of the unit. A polarized three (3) wire AC power cord is also included with the unit to provide cabinet and chassis grounding to the power mains. A front panel power meter calibrated in watts is provided to enable the operator to measure the power actually delivered to the load. A switch is included to enable the selection of either forward or reflected power. A front panel attenuator control sets the output level.

CAUTION

THE MODEL 700A AMPLIFIER IS NOT CRITICAL IN REGARDS TO SOURCE AND LOAD VSWR AND WILL REMAIN UNCONDITIONALLY STABLE WITH ANY MAGNITUDE AND PHASE OF SOURCE AND LOAD WSWR. IT ALSO HAS BEEN DESIGNED TO WITHSTAND, WITHOUT DAMAGE, RF INPUT POWER UP TO TWENTY (20) TIMES ITS RATED INPUT OF 1 mW: HOWEVER, SIGNAL LEVELS HIGHER THAN 20 mW OR TRANSIENTS WITH HIGH PEAK VOLTAGES CAN DAMAGE THE AMPLIFIER. ALSO, ACCIDENTAL CONNECTION OF THE 700A OUTPUT TO THE INPUT CAUSES OSCILLATIONS WHICH WILL PERMANENTLY DAMAGE THE INPUT TRANSISTOR.

2.2 AMPLIFIER OPERATION

Figure 2.1 shows the Model 700A Amplifier in pictorial form.

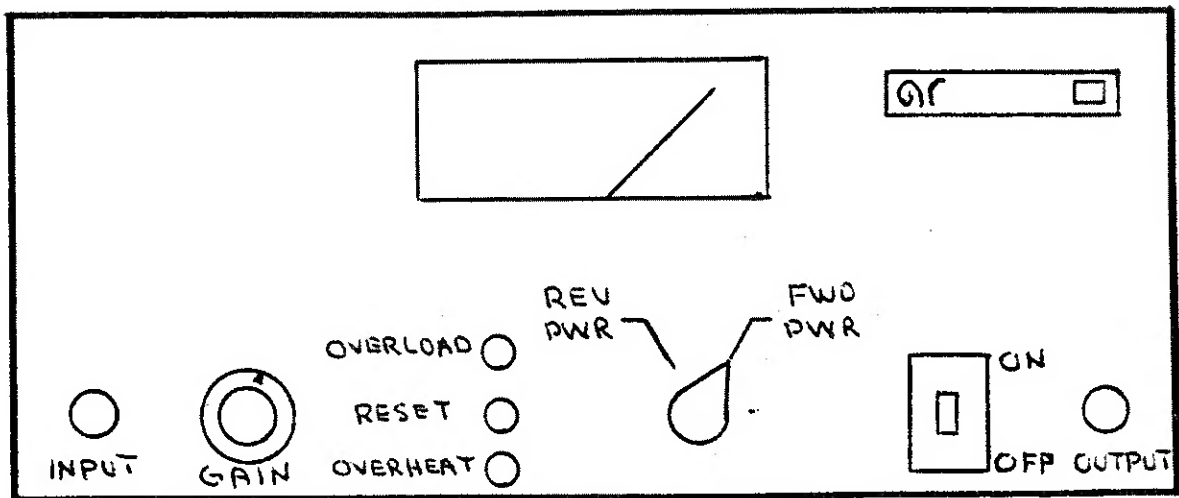


Figure 2.1
Amplifier Operation

Turn On Sequence:

1. Connect input signal to INPUT connector.
2. Connect load to OUTPUT connector.
3. Set GAIN control fully counter clockwise.
4. Activate power switch to ON position. A red indicator light mounted within the switch will light when power is applied.
5. Monitor output power (FWD) and adjust gain for desired level.

SECTION III

THEORY OF OPERATION

3.1 INTRODUCTION

Refer to Block Diagram on the following page. The Model 700A incorporates a low level section which consists of an integrated circuit pre-amplifier followed by a gain control and a single transistor stage which in turn drives a push-pull stage.

The output of the low level stage is fed to a four way power splitter. The four identical outputs of the power splitter are fed to 2 pairs of push-pull stages. The outputs of these stages are combined in the final combiner and routed to the output connector.

Input and output matching networks are utilized to provide optimum power transfer to and from the amplifier with a 50 ohm source and load impedance respectively. Interstage coupling is accomplished by using broadband ferrite transformers that provide the essential overall flat frequency response.

The self-contained power supply employs a full wave rectifier, transistor error sensing amplifier and series pass transistors to provide regulated output voltages. It also utilizes delayed, zero-crossing turn on to avoid high inrush currents.

3.1 INTRODUCTION (continued)

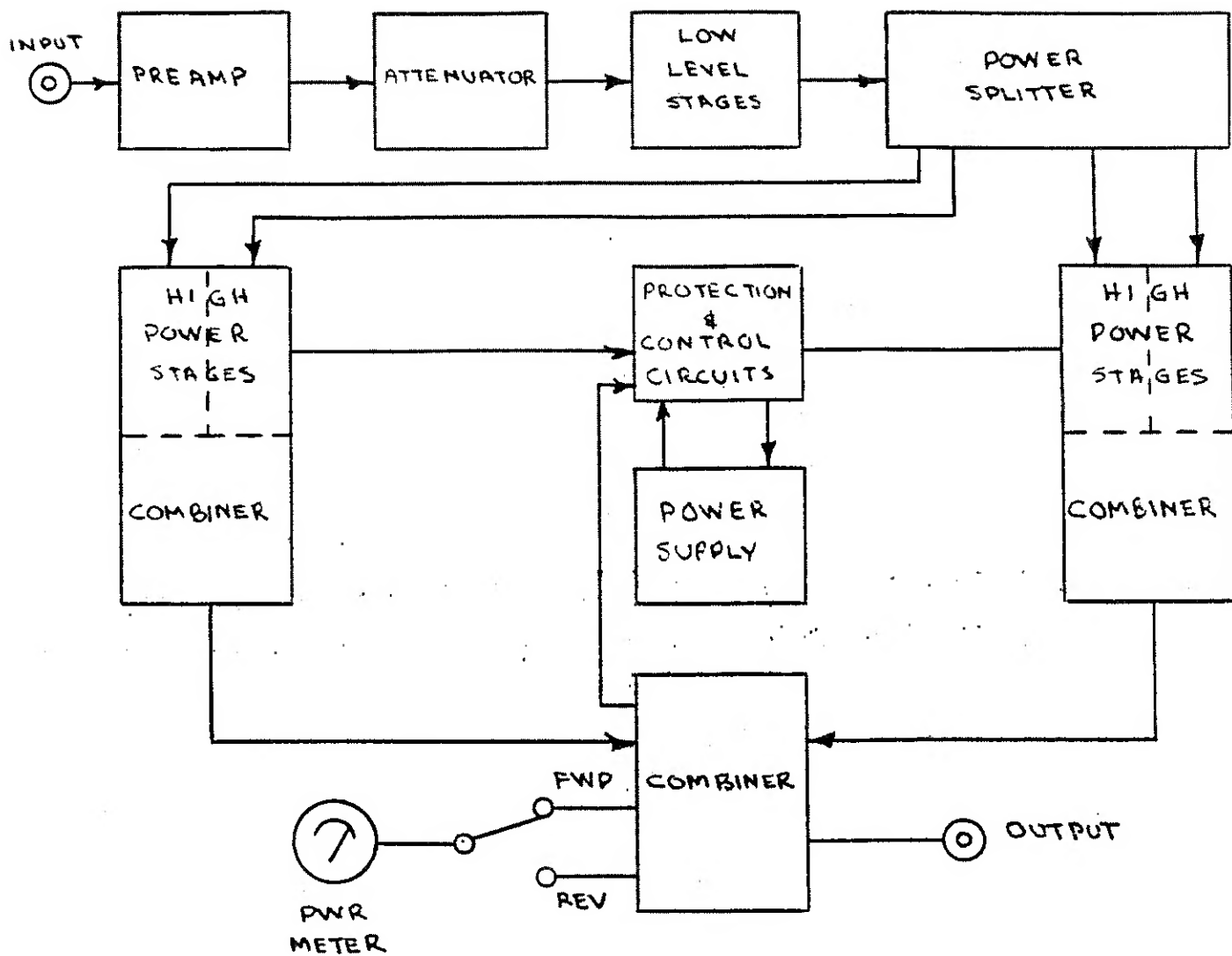


FIGURE 3.1
BLOCK DIAGRAM
MODEL 700A

3.2 AMPLIFIER SECTION

Refer to Schematic Diagram Nos. 1001059, 1000837, 1001054, 1000845.

The input signal is fed from the front panel input connector to the integrated circuit pre-amp A2U1. The output of A2U1 is fed to emitter follower A2Q2 which provides the power and impedance transformation to drive the front panel gain control and the low level stages. The low level amplifier stages (Schematic 1000837) consists of Q1 which is fed through impedance matching transformer T1. The output of Q1 drives the push-pull amplifier stage consisting of T2, Q2, Q3, and T3.

The signal is then fed to the four way splitter consisting of T5, T6, and T7. This provides four identical output signals.

The four identical signals are then fed to two pairs of push-pull amplifier stages (Schematic 1001054). The inputs are transformer coupled to Q1, Q2, and Q3, Q4. Feedback is provided by RC networks from collector to base. Forward bias is provided by two resistors and a diode. This is used to lower crossover distortion. The outputs of each pair are combined in T5. The two outputs are then combined again in the final combiner (Schematic 1000845). This final combining takes place in T1 and T2. This combined signal then goes to the output connector. Integral to the final combiner is a detector circuit which is designed to produce DC voltages proportional to the forward and reflected power. These voltages are selected by the front panel switch and displayed as forward or reverse power (watts) on the power meter. This circuit also supplies forward and reverse overpower shutdown signals to the protective circuitry. The amplifier for the power meter (U2) is located on the turn on circuit board (A2).

3.3 TURN ON AND PROTECTIVE LOGIC CIRCUITRY

Refer to Schematic No. 1001050 and 1001052.

When the power ON switch is activated, +Vcc is applied to the logic circuitry. A2C11 charges through A2R8 until the voltage on A2C11 exceeds the zener voltage on A2VR1 at which time A2Q4 turns on. This provides a signal to the primary AC relay located on the power supply sub-assembly which in turn applies AC power to the high voltage power supply. The time constant of A2R8 and A2R11 provides a delayed turn on which prevents high inrush currents.

3.3 TURN ON AND PROTECTIVE LOGIC CIRCUITY (Continued)

In case of an excess of reflected power, a signal is sent from the final combiner sub-assembly to A1Q3 of the protective circuit sub-assembly. The conduction of A1Q3 turns on A1Q7 which turns on A1Q6. A1Q7 and A1Q6 then act as a latch, remaining in the on condition until reset by the front panel "reset" control. A1Q6 applies a signal to A2Q1 turning off the signal emitter follower A2Q2, and to A2Q3 which turns off A2Q4 removing the turn on signal to the high voltage supply, shutting off the high voltages to the power amplifier stages. The overload indicator lamp is also turned on. Forward power shutdown operation and overcurrent shutdown operation are similar. The forward power shutdown signal originates in the final combiner. The overcurrent shutdown signal originates in U1 of the power supply.

There are temperature sensors located on the power supply sub-assembly and the two final amplifier assemblies. In case of an over-temperature condition a signal is set to A1U1 turning one of the transistors on. Any one of these transistors turning on will turn on A1Q2 which then turns on A1Q1. A1Q1 and A1Q2 again act as a latch, remaining on until reset by the front panel "reset" control. The over temperature lamp is also turned on. A1Q1 again applies a signal to A2Q2 and A2Q3 which operate the same as above. There is also a cover interlock, which prevents turning on the unit with the cover off. The cover interlock signal is supplied from A1R19 through A1Q2 directly to the shutdown circuit.

3.4 POWER SUPPLY

Refer to Schematic Diagrams 1001059 and 1000833.

When the power on switch is activated, 115 VAC power is applied to the low voltage supply (VR1) which supplies the turn on and protective circuitry. It is also applied, at a reduced level through R10 to the bridge rectifier CR1. After the time delay has expired, a signal is sent to K1, a zero-crossing turn on relay, applying full power to CR1. The rectifier current is filtered by C1, then passes through the current limiting resistors, Q3 through Q8, and then to the output. The voltage drop across R2 and R3 is sensed by U1 through R4, R5, and VR4. The trip point of U1 is set by adjusting R5 to turn on X1 with the desired current flowing through R2 and R3. Q1 and VR1 sense any changes in the output. If the voltage increases Q1 turns on harder decreasing the bias to Q2. This lowers the current through the series pass transistors, lowering the output voltage to its original level.

3.4 POWER SUPPLY (Continued)

A decrease in output voltage has the opposite effect, thus regulating the output to the voltage set by R12. This voltage (140V) supplies the final amplifier.

Zener diodes are used to drop the 140 volt supply to 60 volts which is used in the driver amplifier.

SECTION IV

MAINTENANCE

4.1 GENERAL MAINTENANCE INFORMATION

The Model 700A should require little maintenance. It is built with etched circuit wiring and solid state devices which should ensure long, trouble-free life. In addition it contains circuitry to protect it against excess forward or reflected power, overcurrent, and over-temperature conditions.

However, should trouble occur special care must be taken in servicing, to avoid damage to the devices or the etched circuit boards.

Since the components are soldered in place, substitution of components should not be resorted to unless there is some indication that they are faulty. In addition, take care when troubleshooting not to short voltages across the amplifier. Small bias changes may ruin the amplifier due to excessive dissipation or transients.

Components within the Amplifier Research instruments are conservatively operated to provide maximum instrument reliability. In spite of this, parts within an instrument may fail. Usually, the instrument must be immediately repaired with a minimum of "down time". A systematic approach can greatly simplify and thereby speed up the repair.

However, due to the importance of the amplifier's alignment, it is recommended that when failure is caused by breakdown of any of the components in the signal circuits, the amplifier be returned to the factory for part replacement and amplifier realignment. Shipping instructions are as follows: ship PREPAID via United Parcel Service to Amplifier Research Corporation, 160 School House Road, Souderton, PA 18964.

4.2 COVER AND SUB-ASSEMBLY REMOVAL

To remove the top cover take out the screws located in the top and rear flange of the cover. Lift rear of cover and slide out from under front panel flange.

4.2 COVER AND SUB-ASSEMBLY REMOVAL (Continued)

To remove the Amplifier and power supply sub-assemblies disconnect all connectors and remove the 6 mounting screws for each assembly from the bottom of the unit.

Logic ards can be removed by taking out the mounting screws located in the upper corners of the card and gently pulling the cards from their connectors.

CAUTION: When removing mounting screws do not drop the card separating spacers into the unit.

4.3 AIR FILTER SERVICE

Both outer side panels should be removed periodically and the air filters located behind them cleaned or replaced periodically.

CAUTION: Failure to properly service air filters can cause overheating and shorten life of the Amplifier.

4.4 TROUBLESHOOTING

A good way to start troubleshooting is to check the supply voltages. First check for +12V at A1VR1. If it is low or missing, check the line fuse, VR1 and associated circuitry on the A2 board. If it is present next check for 140 volts on the regulated power supply module. If it is missing check for a turn-on signal at K1-3. If the signal is missing check through the logic circuitry, also checking that none of the protective shutdown conditions exist, and that the cover interlock switch is energized or bypassed. If the turn on signal is present check the power supply from CR1 through to the output.

If all the voltages are present, apply a signal to the input and attempt to trace it through the signal path until it disappears. Then check the individual components in that stage.

4.5 SERVICING ETCHED CIRCUIT BOARDS

When soldering leads, use a hot forty (40) watt or smaller iron. Apply heat sparingly to the leads, not to the printed wiring on the board. Before installing new parts clean holes to receive new part without forcing. Have new leads tinned to receive solder quickly with a minimum of heat and without residue.

SECTION V

REPLACEABLE PARTS

5.1 INTRODUCTION

This section contains information to ordering replacement parts. The following parts list show the parts in alphanumeric order of their reference designators and indicate the description; end, together with any applicable notes, provide the following:

- a. Description of the part.
- b. Manufacturer's part number.
- c. Typical manufacturer of the part.

Miscellaneous parts are listed at the end of the parts list.

5.2 ORDERING INFORMATION

To obtain replacement parts, address order to Amplifier Research, 160 School House Road, Souderton, PA 18964. Identify and include instrument model and serial numbers.

5.3 NONLISTED PARTS

To obtain a part that is not listed, include:

- a. Instrument model number.
- b. Instrument serial number.
- c. Description of the part.
- d. Function and location of the part.

5.4 REFERENCE DESIGNATIONS

A = assembly
B = fan
BT = battery
C = capacitor
CB = circuit breaker
CR = diode
DS = lamp
E = terminal
F = fuse
IC = integrated circuit
J = jack
K = relay
L = inductor
M = meter
P = plug
Q = transistor, semiconductor
R = resistor, potentiometer
RT = temperature sensing element
S = switch
T = transformer
TB = terminal block
TP = test point
U = integrated circuit
V = vacuum tube, neon bulb, photocell, etc.
VR = zener diode
W = wire, cable
X = socket

5.5 PARTS LISTS

See the following sheets for Parts Lists.

DESCRIPTIVE INFORMATION	SUPPORT DOCUMENTS
FREQUENCY 10-250 KHz	TEST DATA SHEET 1001044
POWER OUT 700W LINEAR	TEST PROCEDURE 1001903
PRIMARY POWER 115 VAC	ENVELOPE DWG -
COOLING INTERNAL FANS	SALES DATA SHEET INFORMAL
PACKAGE 17" LAB 7" PANEL	MANUAL CLASS I (SEE REVERSE SIDE)
OPTIONS INCLUDED	REMARKS

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FORM 109 REV0378



DATE	R	DATE	R
28 MAR 78	-	8 JUN 79	B
26 DEC 78	A		

MASTER LIST


ECN

1000833										SCHEMATIC				A		12 JUL 76	
														B		26 JUL 76	
														C		12 NOV 76	
														D			
														E		2 MAR 78	
														F		13 APR 78	
														G		13 NOV 80	
														H		5 FEB 82	

QUANTITY REQUIRED										PART NO.		DESCRIPTION		VALUE	TOL	RATING	SPECIFICATION OR VENDOR
509	508	507	506	505	504	503	502	501	ITEM OR SYMBOL								
								8	4778A	INSULATOR(TIP-35)							
								1	1000817-101	PC BOARD							
								1	1000823-101	HEAT SINK							
								-	TXBF-030-025B	HEAT SINK							
								1	U1 4N27 (MOC100A)	OPTO-ISOLATOR							
								1	VR4 SZ 2.8 1%	ZENLR DIODE		2.8V	1%				
								1	VR1 1N5231	ZEILR DIODE							

A	12	276
B	26	JUL 76
C	12	Nov 76
D	9	SEP 77
E	3	MAR 78
F	18	APR 78
G	29	AUG 78
H	8	JUN 79
J		1 JUN 83

[illegible]

 AMPLIFIER RESEARCH		APPROVED E.E.	DATE	APPROVED M.E.	DATE	ORIGINATOR DW ROTH	DATE 25 MAR 76
		TITLE HVPS ASSY. DWG. NO. PL1000835 SHEET 1 OF 3 REV J					

203


[illegible]


 AMPLIFIER RESEARCH		APPROVED E.I.	DATE	APPROVED M.E.	DATE	ORIGINATOR	DATE
		TITLE RF BOARD ASSY				DW. NO. PL1000838	25 Mar 76
		LOW LEVEL				SHEET 1 OF 7	REV J





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APPROVED E.E.	DATE	APPROVED M.E.	DATE	ORIGINATOR DWR, JR	DATE 1 Apr 76
TITLE MODULE ASSY			OWG. NO. PL1000841		
POWER AMPLIFIER			SHEET 1 OF 1 REV F		





QUANTITY REQUIRED										ITEM OR SYMBOL	PART NO.	DESCRIPTION	VALUE	TOL	RATING	SPECIFICATION OR VENDOR
509	508	507	506	505	504	503	502	501								
							1	1	P3	03-07-2151	SHELL, FEMALE	15 PIN				WALOOM
							7	8	P3	02-09-2118	PIN, MALE					WALOOM
							1	1	P2	33-772	CONN, COAX	MALE				GC ELECTRONICS
							1	1	P1	33-772	CONN. COAX	MALE				GC ELECTRONICS
							-	1	L1	1000859-101	FORM, INDUCTOR					AR 
							-	1	L2	023-623X1-11-26-1-1	INDUCTOR, TOROID					AR
							-	1	L3	023-623X1-11-26-1-1	INDUCTOR, TOROID					AR
							1	-	L2	.010X.100	STRAP					
							1	-	L3	.010X.100	STRAP					
							1	1	CR4	1N4448	DIODE					
							1	1	CR3	1N4448	DIODE					
							1	1	CR2	1N4448	DIODE					
							1	1	CR1	1N4448	DIODE					
							-	1	C7	811-000X5R0472	CAP, FXD, CERAMIC	4700pF		500V	ERIE	
							-	1	C6	811-000X5R0472	CAP, FXD, CERAMIC	4700pF		500V	ERIE	
							1	1	C5	5815000Y5U204Z	CAP, FXD, CERAMIC	0.2µF		25V	ERIE	
							1	1	C4	5815000Y5U204Z	CAP, FXD, CERAMIC	0.2µF		25V	ERIE	
							1	1	C3	5815000Y5U204Z	CAP, FXD, CERAMIC	0.2µF		25V	ERIE	
							1	1	C2	5815000Y5U204Z	CAP, FXD, CERAMIC	0.2µF		25V	ERIE	
							1	1	C1	811-000X5R0472	CAP, FXD, CERAMIC	4700pF		500V	ERIE	


AMPLIFIER RESEARCH

APPROVED  DATE  APPROVED  DATE 


TITLE POWER COMB & DIRECT N- DETECTR

ORIGINATOR  DATE 

OWG. NO. PL1000852

SHEET 2 OF REV H

QUANTITY REQUIRED										ITEM OR SYMBOL	PART NO.	DESCRIPTION	VALUE	TOL	RATING	SPECIFICATION OR VENDOR
509	508	507	506	505	504	503	502	501								
								1	CR7	IN4448	DIODE					ANY
								1	CR6	IN4448	DIODE					ANY
								1	CR5	IN4448	DIODE					ANY
								1	CR4	IN4448	DIODE					ANY
								1	CR3	IN4448	DIODE					ANY
								1	CR2	IN4448	DIODE					ANY
								1	CR1	IN4448	DIODE					ANY
								1	C9	811-000Z5U0103M	CAP, FXD, CERAMIC	.01 μ F			500V	ERIE
								1	C8	811-000Z5U0103M	CAP, FXD, CERAMIC	.01 μ F			500V	ERIE
								1	C7	811-000Z5U0103M	CAP, FXD, CERAMIC	.01 μ F			500V	ERIE
								1	C6	5815-000Y5U104Z	CAP, FXD, CERAMIC	0.1 μ F				ERIE
								1	C5	811-000Z5U0103M	CAP, FXD, CERAMIC	.01 μ F			500V	ERIE
								1	C4	811-000Z5U0103M	CAP, FXD, CERAMIC	.01 μ F			500V	ERIE
								1	C3	811-000Z5U0103M	CAP, FXD, CERAMIC	.01 μ F			500V	ERIE
								1	C2	TVA-1305.5	CAP, FXD, TANT	20 μ F			50V	SPRAGUE
								1	C1	811-000Z5U0103M	CAP, FXD, CERAMIC	.01 μ F			500V	ERIE



APPROVED
E.E.

DATE

APPROVED
M.E.

DATE

ORIGINATOR
P.R.W.

DATE
16 Nov 77

TITLE
LOGIC BOARD ASSY, AI

DWG. NO.
PL1001053


SHEET 2 OF

REV A

QUANTITY REQUIRED										ITEM OR SYMBOL	PART NO	DESCRIPTION	VALUE	TOL	RATING	SPECIFICATION OR VENDOR
509	508	507	506	505	504	503	502	501								
									1	U1	CA3081	IC, XSTR ARRAY, 16 LEAD, DIP				RCA
									1	VR2	IN5230	DIODE, ZENER	4.7V		.5A	ANY
									1	VR1	IN5230	DIODE, ZENER	4.7V		.5A	ANY
									1	XU1	C93-16-02	SOCKET, IC, 16 PIN, DIP				TI
									1	1	100820-101	PC BOARD				AR
									2							
									3							
									4							
									5							

 AMPLIFIER RESEARCH	APPROVED E.E.	DATE	APPROVED M.E.	DATE	ORIGINATOR P.R.W.	DATE 16 Nov 77
	TITLE LOGIC BOARD ASSY, A1				DWG. NO. PL1001053	
	SHEET 6 OF				REV -	

QUANTITY REQUIRED										ITEM OR SYMBOL	PART NO.	DESCRIPTION	VALUE	TOL	RATING	SPECIFICATION OR VENDOR
509	508	507	506	505	504	503	502	501								
								1	R22	RC07	RES, FXD, COMP	2.2K	5%	1/4W	ANY	
								1	R21	4549	RES, FXD, WW	5Ω	5%	5W		
							-	1	R20	RN60D274ZF	RES, FXD, FILM	27.4K	5%	1/4W	ANY	
							-	1	R19	RC42	RES, FXD, COMP	560Ω	5%	2W	ANY	
							1	1	R18	1805	RES, FXD, WW	25Ω		20W	OHMITE	
							1	1	R17	RC07	RES, FXD, COMP	680Ω	5%	1/4W	ANY	
							1	1	R16	RC07	RES, FXD, COMP	680Ω	5%	1/4W	ANY	



APPROVED E.E.	DATE	APPROVED M.E.	DATE	ORIGINATOR	P.R.W.	DATE
TITLE			LOGIC BOARD ASSY, A2			22 Nov 77
			OWG. NO. PL1001056			
			SHEET 4 OF			REV B

QUANTITY REQUIRED										ITEM OR SYMBOL	PART NO.	DESCRIPTION	VALUE	TOL	RATING	SPECIFICATION OR VENOOR
509	508	507	506	505	504	503	502	501								
									25							
									24							
								AR	23			THERMAL JOINT COMPOUND				
								AR	22	6-32 x 3/8		SCREW, SELF-TAP				
									21							
									20							
									19							
								8	18	#6		WASHER, FLAT				
								4	17	#6 INTERNAL TH		WASHER, LOCK				
								8	16	6-32 x 1/2		SCREW, PAN HD				
								4	15	4726A		INSULATOR, TO-3				THERMALLOY
								4	14	#6		LUG, SOLDER				
								8	13	#6 ID		WASHER, SHOULDER, NYLON				
								8	12	.3120D x .164 ID x .060		SPACER				AERO - MISSILE
									11							
								8	10	450-3286-003		SOCKET, PIN				CAMBION
									9							
									8							
									7							
									6							AR
								1	5	1000803-101		HEATSINK				
									4							
									3							
									2							
								1	1	1000802-101		PC BOARD				AR

APPROVED E.E.		DATE	APPROVED M.E.	DATE	ORIGINATOR P.R.W.	DATE 22 Nov 77
TITLE RF BOARD ASSY				DWG. NO. PL1001058		
FINAL AMP				SHEET 6 OF REV C		



QUANTITY REQUIRED										ITEM OR SYMBOL	PART NO.	DESCRIPTION	VALUE	TOL	RATING	SPECIFICATION OR VENDOR	
509	508	507	506	505	504	503	502	501									
					1	-	-	-	J10	UG-568/U	CONNECTOR, COAX	C				ANY	
					-	-	1	-	J10	UG-625 B/U	CONNECTOR, COAX	BNC				ANY	
					-	1	-	1	J10	UG-2628U	CONNECTOR, COAX	BNC				ANY	
					1	1	-	1	J9	KC-19-288	CONNECTOR, COAX	BNC				KINGS	
					-	-	1	-	J9	UG-625 B/U	CONNECTOR, COAX	BNC				ANY	
					-	-	-	-	J8	NOT USED							
					-	-	-	-	J7	NOT USED							
					-	-	-	-	J6	NOT USED							
					2	2	2	2	J5	02-09-2118	PIN, MALE					WALDOM	
					8	8	2	8		02-09-1118	PIN, FEMALE						WALDOM
					1	1	1	1		03-09-1151	SHELL, FEMALE						WALDOM
					2	2	2	2	J4	02-09-2118	PIN, MALE					WALDOM	
					11	11	11	11		02-09-1118	PIN, FEMALE						WALDOM
					1	1	1	1		03-09-1151	SHELL, FEMALE						WALDOM
					2	2	2	2	J3	02-09-2118	PIN, MALE					WALDOM	
					9	9	9	9		02-09-1118	PIN, FEMALE						WALDOM
					1	1	1	1		03-09-1151	SHELL, FEMALE						WALDOM
					1	1	1	1	J2	143-036-01	CONNECTOR, PC					AMPHENOL	
					1	1	1	1	J1	143-036-01	CONNECTOR, PC					AMPHENOL	
																SPECIFICATION OR VENDOR	

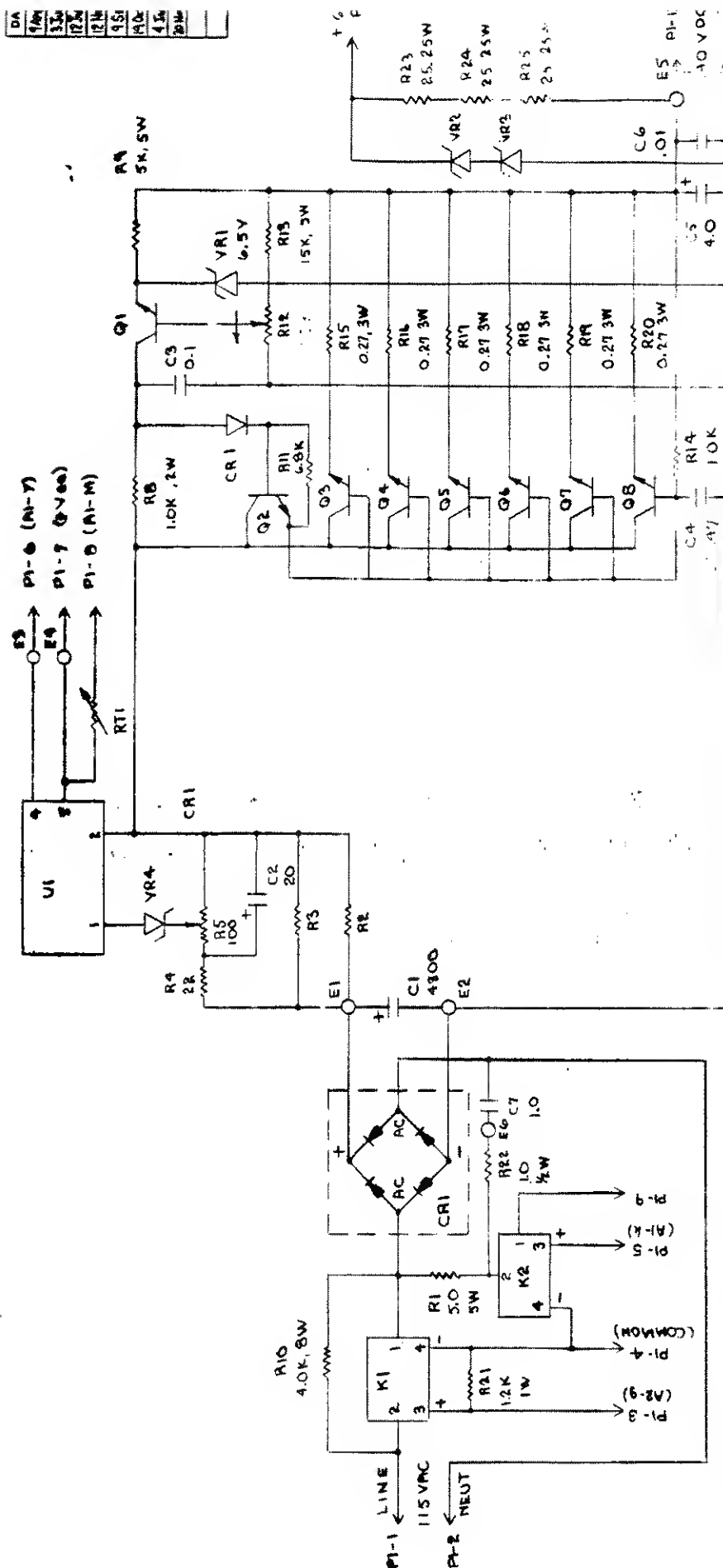
AMPLIFIER RESEARCH		APPROVED E.E.	DATE	APPROVED M.E.	DATE	ORIGINATOR	P.R.W.	DATE	23 Nov 77
		TITLE			HOUSING & INTERFACE ASSY		DWG. NO.		PL1001060
		SHEET			3		OF		REV
									G

QUANTITY REQUIRED										ITEM OR SYMBOL	PART NO.	DESCRIPTION	VALUE	TOL	RATING	SPECIFICATION OR VENDOR
509	508	507	506	505	504	503	502	501	25							
						36"	-	-	24		RQ-210/U	CABLE, COAX (950)				FOR OUTPUT CABLE
							-	-	23		RQ-142 B/U	CABLE, COAX				FOR OUTPUT CABLE
						1	1	1	22		1000249-101	NAMEPLATE				AR
						4	4	4	21		1/4 HEX x 6-32 x 2 1/4	SPACER (MTG J3, J4, J5)				
						2	2	2	20		1/4 HEX x 6-32 x 3/4	SPACER (PC BOARD SUPPORT)				
						4	4	4	19		1/4 HEX x 6-32 x 5/8	SPACER (MTG J1 + J2)				
						6	6	10	18		1/4 HEX x 6-32 x 1/2	SPACER (MTG J1 + J2)				
						2	2	2	17		1/4 HEX x #6 x 1/2	SPACER (PC BOARD SUPPORT)				
						1	1	1	16		RB-67-1-SK-7-M	KNOB, SKIRTED				ROGAN
						2	2	1	15		RB-67-1-P-DG-M	KNOB, POINTER				ROGAN
						1	1	1	14		1523	STRAIN RELIEF				GC
						1	1	1	13		17419	LINE CORD				BELDEN
						2	2	2	12		ED155B	HANDLE				UNICORP
						4	4	-	11		2182	FOOT, CHASSIS				H.H. SMITH
						2	2	2	10		65-175	GUARD, FINGER				IMC
						1	1	1	9		2005	TERMINAL STRIP				CINCH-JONES
						-	-	1	8		1000832-111-1	PANEL, FRONT				PR
						1	1	1	7		1000832-102-1	PANEL, REAR				PR
						1	1	1	6		1001042-501	ATTENUATOR				AR
						1	1	1	5		1000860-101	PLATE, MTG, CONN.				AR
						2	2	2	4		1000832-301	PLATE, SIDE, INTERNAL				AR
						1	1	1	3		1000832-105	PLATE, MTG, BOTTOM				AR
						-	-	-	2		1000832-119-2	PANEL, REAR				AR
						1	1	-	1		1000832-116-1	PANEL, FRONT				AR



APPROVED E.E.	DATE	APPROVED M.E.	DATE	ORIGINATOR P.R.W.	DATE 23 Nov 77
TITLE INTERFACE & HOUSING ASSY				OWG. NO. PL1001060	
				SHEET 5 OF REV E	

SECTION VI
SCHEMATICS



NOTES-

- 1.0 UNLESS OTHERWISE SPECIFIED:
RESISTOR VALUES ARE OHMS
RESISTOR RATINGS ARE $\frac{1}{4}W$
CAPACITOR VALUES ARE MICROFARADS
- 2.0 THIS SCHEMATIC MAY REPRESENT MULTIPLE ASSEMBLIES. SEE APPROPRIATE PARTS LIST FOR FINAL COMPONENT VALUES.

REFERENCE DESIGNATIONS

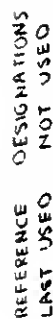
REFERENCE DESIGNATOR	NOT USED
C7	R25
CR1	RT1
K2	VR4
Q5	U1
TA	P1

UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING.		DRAWN DWG. 44		PART NO.		DESCRIPTION		M F A I R K	
DATE 3 May 76		DATE		DATE		DATE		DATE	
CHKD		TREN		TREN		TREN		TREN	
UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING.		DATE		DATE		DATE		DATE	
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS.		TREN		TREN		TREN		TREN	
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2.		DATE		DATE		DATE		DATE	
REMOVE ALL BURRS AND SHARP EDGES.		TREN		TREN		TREN		TREN	
TOLERANCES: ± .010.		DATE		DATE		DATE		DATE	

**SCHEMATIC DIAG
HVPS & REG ASSY**

100-933


4 Apr 91
18 May 7
12 Jun 7
8 Sep 7
9 Oct 7
3 Nov 7
18 Dec 7



11.0 UNLESS OTHERWISE SPECIFIED
11.1 CAPACITOR VALUES ARE SHOWN IN MICROFARADS

1.2 RESISTOR VALUES ARE SHOWN IN OHMS

SEE APPROPRIATE PARTS LIST FOR
COMPONENT VALUES

QTY. REQ.				I T E M		PART NO.		PARTS LIST		DESCRIPTION		M A R K		F I N	
UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING.						DRAWN DWL:gtt				AMPLIFIER RESEARCH					
DIMENSIONS ARE IN INCHES AND MILLI- METERS AND INCLUDE PLATING THICKNESS.						DATE 29 Nov 76				SCHEMATIC DIAG LOW LEVEL AMP		DWG. DESG. NO. 1000837		SHEET 1 OF 1	
ALL THREADS ARE UNFINISHED NATIONAL, SERIES, CLASS 2.						DATE				DWG. SCALE					
REMOVE ALL MARKS AND SHARP EDGES.						DATE									
TOLERANCES ± .005.						DATE									

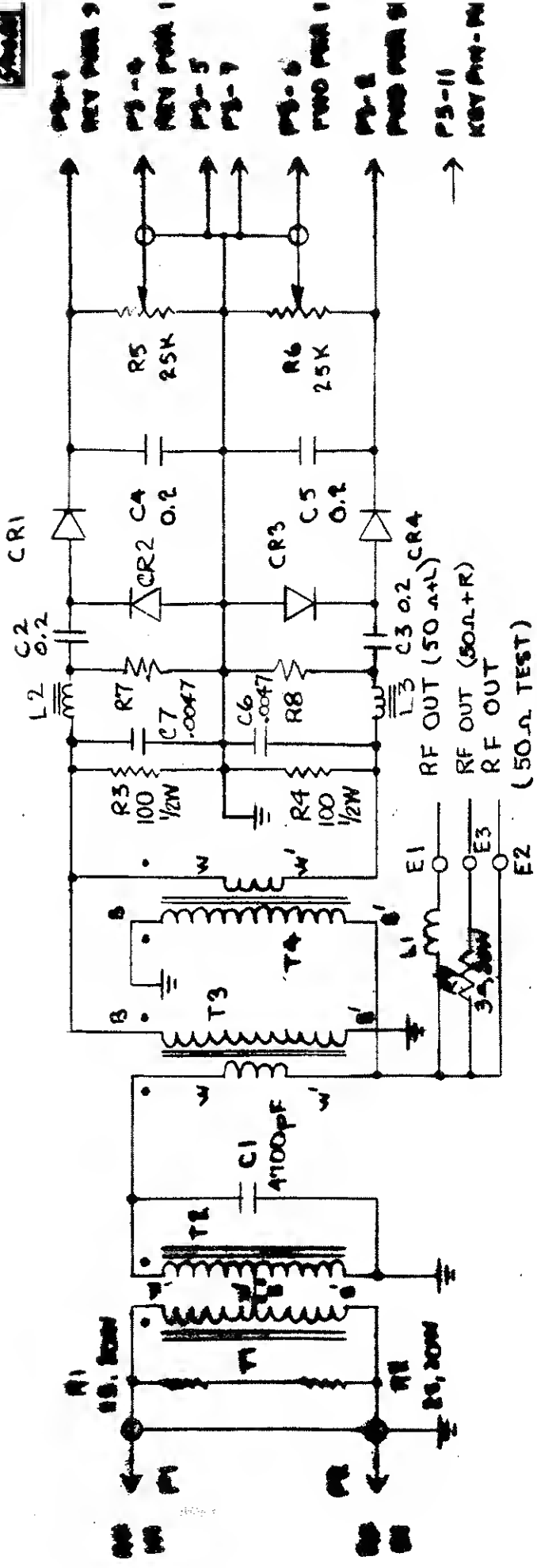


**SCHEMATIC DIAG
LOW LEVEL AMP**

1000837

— 5 —

DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME
1/20/76	5:00 PM	5/10/76	5:00 PM	5/10/76	5:00 PM	5/10/76	5:00 PM



NOTES:

- 1.0 UNLESS OTHERWISE SPECIFIED:
RESISTOR VALUES ARE OHMS
RESISTOR RATINGS ARE 1/4 WATT
CAPACITOR VALUES ARE MICROFARADS
- 2.0 THIS SCHEMATIC MAY REPRESENT MULTIPLE ASSEMBLIES. SEE APPROPRIATE PARTS LIST FOR FINAL COMPONENT VALUES.

REFERENCE DESIGNATIONS

LAST USED	NOT USED
C7 P3	
CR4 R9	
E3 T4	
3	

850
700A
796

DATE		TIME		DATE		TIME	
1/20/76		5:00 PM		5/10/76		5:00 PM	

QTY.	REQD.	DESCRIPTION	PARTS LIST	PART NO.
UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING.				
DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS.				
ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2.				
REMOVE ALL BURRS AND SHARP EDGES.				
TOLERANCE : ±.010.				

DRAWN DW0004		DATE 1 Apr 76	
CHKD		DATE	
MECH		DATE	
ELFC		DATE	

DWG. NO.		DWG. NO.	
1000845		1000845	
SHEET 1		SHEET 1	

RESEARCH

SCHEMATIC DIAG.
FINAL COMB & DETEC

[illegible]

QTY. REQD.		I T E M		PART NO.		DESCRIPTION		MARK	
<p>UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING.</p> <p>DIMENSIONS ARE IN INCHES AND FRACTIONS UNLESS OTHERWISE SPECIFIED.</p> <p>ALL THREADS ARE UNFRAISED UNLESS OTHERWISE SPECIFIED.</p> <p>REMOVE ALL DIMENSIONS AND SWAP BLOCKS.</p> <p>TOLERANCES ± .010.</p>				<p>DRAWING</p> <p>DATE</p> <p>16 May 71</p>		<p>SCHEMATIC DIAG</p> <p>RF DO FINAL AMP</p>		<p>1001064</p> <p>SHEET</p>	



WARRANTIES: LIMITATION OF LIABILITY

Seller warrants (i) that seller has title to the goods sold and (ii) that the goods will be free from defects in material and workmanship for a period of one year from date of shipment shown on Amplifier Research invoice. Seller's sole responsibility in fulfilling these warranties shall be to repair or replace any goods which do not conform to the foregoing warranties or, at seller's option, to give buyer credit for defective goods. Warranty service will be provided only for defective goods which are returned within the warranty period, freight costs prepaid, to Amplifier Research or its designated repair facility.

THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS. SELLER SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM ANY BREACH OF WARRANTY.

No person other than an officer of Amplifier Research Corporation, has any authority to bind seller to any affirmation, representation or warranty except as specifically included in the preceding terms and conditions.

TEST DATA SHEET

FREQ (KHz)	POWER OUTPUT: 100W RMS		POWER OUTPUT: 300W RMS	
	GAIN (dB)	DISTORTION (%)	GAIN (dB)	DISTORTION (%)
10	61.8	2.2	60.3	5.4
15	62.3	2.2	60.5	7.2
20	62.3	2.2	61.1	7.8
30	62.8	2.2	62.1	6.0
50	63.0	1.8	62.1	6.2
75	63.2	2.0	61.9	7.2
100	63.3	2.7	61.9	8.2
150	63.6	2.9	62.0	8.2
175	63.7	3.0	62.0	8.0
200	64.0	3.4	61.8	7.6
225	64.1	3.4	61.8	7.4
250	64.1	3.4	61.5	7.6

OPEN & SHORT TEST ✓

OVERDRIVE SHUTDOWN 500 WATTS RMS

VSWR SHUTDOWN 200 WATTS RMS

160 SCHOOL HOUSE ROAD
SOUDERTON, PA. 18964

PHONE: 215-723-8181

1001044

TY. REQD.		RE. DRAWN		UNLESS OTHERWISE SPECIFIED DD NOT SCALE DRAWING.		DIMENSIONS ARE IN INCHES AND INCLUDE PLATING THICKNESS.		ALL THREADS ARE UNIFIED NATIONAL SERIES, CLASS 2.		REMOVE ALL BURRS AND SHARP EDGES.		TOLERANCE: ±.010.	
I		E		M		DATE		DATE		DATE		DATE	
PART NO.		DESCRIPTION		PARTS LIST		DATE		DATE		DATE		DATE	
M		F		N		K		A		R		M	
L		T		A		M		REV.		DWG. ND.		SHEET	
1001059		1001059		1001059		1001059		1001059		1001059		1001059	
AMPLIFIER RESEARCH		INTERCONNECT DIAGRAM		HOUSING & INTERFACE		DWG. ND.		SHEET		DWG. ND.		SHEET	

